

**REMARKS**

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

**I. Status of the Claims**

With this submission, claims 1, 3, 5-14 are currently amended. Support for these claim amendments can be found throughout the specification. Claims 2, 4, and 15 are canceled. No claims are newly added. Hence, upon entry of this paper, claims 1, 3, 5-14, and 16-17 are pending with claims 1, 3, 5-14 under active consideration.

The cancellation of claims does not constitute acquiescence in the propriety of any rejection set forth by the Office. Applicants reserve the right to pursue the subject matter of the canceled claims in subsequent divisional applications.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

**II. November 2, 2006 Amendment to the Specification**

The Office has not entered the November 2, 2006 preliminary amendment to the specification. The Office alleges that the amendment was improper because it “substantially changes the nature of the invention...and introduces new matter” (Office Action, page 2).

The word in question corresponds to the English translation of “OOMUGI” in the Japanese specification of the PCT application, and in the specification of the US application, it is translated as “barley” in the other parts of the claims and specification. Therefore the correction of the translation is merely a correction of an inappropriate translation. As such, Applicants renew the request to enter the amendment to the specification.

### **III. Claim Rejection Under 35 U.S.C. §103**

Claims 1-15 are rejected as allegedly obvious over Speers in view of Nagarajan. The Office admits that the claims “differ from Speers in that they specify the growth phase of the yeast is late log phase or thereafter” (Office Action, page 3). Nevertheless, the Office argues that Nagarajan teaches different growth phases and degrees of flocculations thereby remedying the deficiencies of Speers (Office Action, page 3). Applicants respectfully traverse the rejection.

#### **A. Summary of the Embodiments of the Invention**

As disclosed in the present specification, during the brewing of fermented malt beverages or the like such as beer, HAPPOSHU, or whiskey, yeast flocculates and precipitates reasonably at the end of the main fermentation by yeast. After this flocculation and precipitation, yeast can be collected. If yeast does not flocculate and precipitate reasonably at the end of the main fermentation, then the recovery level of yeast will be insufficient. In contrast, if the flocculation and precipitation are excessive, fermentation will not proceed, thus causing a problem (paragraph [0002]).

During the brewing of fermented malt beverages, in a normal fermentation step, flocculation and precipitation of yeast occurs reasonably at the end of the main fermentation of yeast, when extract of fermentation solution lessens. However, it has been reported that a phenomenon called “early flocculation phenomenon” is observed to this flocculation and precipitation of yeast. This “early flocculation phenomenon” relates to a phenomenon wherein yeast flocculates and precipitates, while assimilable sugar in yeast is still present in the fermentation solution, during the fermentation process of yeast, particularly in the late phase of the fermentation. When yeast flocculates and precipitates by this early flocculation phenomenon, the fermentation process will stop. Therefore, when this phenomenon occurs, fermentation will be insufficient, thus the manufactured products would be below standard, and it would be a significant loss in the brewing of fermented malt beverages and the like (paragraph [0003]).

Conventionally, in brewing of fermented malt beverages comprising barley as a raw material, in order to avoid the early flocculation phenomenon during the fermentation process, presence or absence of the early flocculating property of malt and barley was confirmed to select and use barley and malt that do not induce early flocculation phenomenon. However, a method using a fermentation test has been applied as conventional method, which required a long time (paragraphs [0004] to [0006]).

Therefore, in the present invention, in order to solve these problems, when making a keen study of a method for measuring factors causing early flocculation of yeast contained in brewing materials, in a short time period and easily, without processing fermentation process as in the conventional methods, Applicants found that by using the method specified in claim 1, it is possible to measure factors causing early flocculation of yeast contained in brewing materials, in a quite short time period, without performing the fermentation process as in conventional methods. Based on this knowledge, Applicants succeeded in developing a method for measuring factors causing early flocculation of yeast contained in brewing materials of the present invention.

Therefore, the fundamental feature of the present invention lies in the above points.

**B. Speers and/or Nagarajan Alone or in Combination Do Not Teach the Claimed Invention**

When determining whether a claim is obvious, an examiner must make “a searching comparison of the claimed invention – *including all its limitations* – with the teaching of the prior art.” *In re Ochiai*, 71 F.3d 1565, 1572 (Fed. Cir. 1995) (emphasis added). Thus, “obviousness requires a suggestion of all limitations in a claim.” *CFMT, Inc. v. Yieldup Intern. Corp.*, 349 F.3d 1333, 1342 (Fed. Cir. 2003) (*citing In re Royka*, 490 F.2d 981, 985 (CCPA 1974)). Moreover, as the Supreme Court recently stated, “*there must be some articulated reasoning* with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (emphasis added)). The failure of an asserted combination to teach or suggest each and every feature of a claim remains fatal to an obviousness rejection under 35 U.S.C. § 103 and MPEP 2143.03.

In the instant case, the amended claims require “2) a step for preparing a water extracted high molecular weight fraction of a test material sample...3) a step for preparing a test system by mixing and suspending the yeast prepared in step 1) with the high-molecular weight fraction prepared in step 2), in a buffer solution; and 4) a step for measuring a precipitation level of the yeast mixed in the test system which was mixed and suspended in the buffer solution in the above step 3)” (see amended claim 1). Nowhere does Speers describe steps 2, 3 or 4 of the presently claimed invention. Additionally, Nagarajan does not remedy this deficiency. Therefore, Applicants believe Speers and Nagarajan alone or in combination do not render the claims obvious.

Speers reports on “Toward an Ideal Flocculation Assay”, and the Office points to, “a method of rapid estimation of flocculation of yeast” describing the “[Measurement of] flocculation number at 30 min and equilibrium” (Speers page 174 column 2). Further, as an *in vitro* technique having Official status with the European Brewing Convention, the Helm method, etc. are described. The description states that (a) Yeast is washed in EDTA, suspended in acetate buffer with EDTA, add calcium chloride and measure flocculation at 30 minutes; and (b) spectrophotometer at a wavelength of 600 nm is used for the measurement of sedimentation of yeast flocculation (Speers pages 174 to 175; Fig. 1). Additionally, in the section of “Assay Media Consideration”, the relationship with various properties of beer is described as assay media (Speers page 175).

When comparing the method of the present invention to that disclosed in Speers, Speers describes the treatment of yeast in the method of estimation of flocculation of yeast and a measurement of sedimentation of yeast flocculation using a wavelength of 600 nm. However, there is no description on “2) a step for preparing a water extracted-high-molecular weight fraction of a test material sample; 3) a step for mixing and suspending the yeast prepared in step 1) with the high-molecular weight fraction prepared in step 2), in a buffer solution; and 4) a step for measuring a precipitation level of the yeast mixed and suspended in the above step 3).”

Additionally, one requirement of the present invention needed to achieve the effect of the present invention is “1) a step for preparing yeast at **late logarithmic growth phase or thereafter.**” The Office correctly notes that Speers does not describe this point.

Therefore, Speers does not teach the invention as specified in presently pending claim 1, or its effect, and a person skilled in the art could not readily conceive the present invention from Speers. Specifically, Speers does not teach steps 2, 3, 4, or use of yeast in the late logarithmic growth phase or thereafter.

Nevertheless, the Office attempts to use Nagarajan to cure the deficiencies of Speers. Nagarajan reports “Antigenic studies on flocculating brewer’s yeast, *Saccharomyces cerevisiae* NCYC 227” and the Office points to Table 1 of p. 1748, showing the results of degree of flocculation in different growth phases are shown for flocculation of *S. cerevisiae* NCYC 227.

However, Nagarajan only shows the flocculation generated when generally culturing yeast *S. cerevisiae*, with respect to the growth phase of yeast, and it does not measure and show the relationship with growth phase of yeast and factors causing early flocculation. Specifically, Nagarajan does not teach that it is possible to measure factors causing early flocculation of yeast contained in brewing materials, in a quite short time period, without performing fermentation process as in conventional methods, with “1) a step for preparing yeast at late logarithmic growth phase or thereafter; 2) a step for preparing a water extracted high molecular weight fraction of a test material sample; 3) a step for mixing and suspending the yeast prepared in step 1) with the high-molecular weight fraction prepared in step 2), in a buffer solution; and 4) a step for measuring a precipitation level of the yeast mixed and suspended in the above step 3)”.

For at least these reasons, the present invention is not taught by Nagarajan and/or Speers alone or in combination. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejection.

**IV. Claim Rejection Under 35 U.S.C. §112, first paragraph**

Claims 1-15 are being rejected as allegedly failing to comply with the written description requirement. The Office states “[a] reading of the invention may rely on determining the rate of flocculation without performing fermentation. This has not been claimed and the claims as presented do not exclude fermentation” (Office Action, page 5).

In an effort to advance prosecution of this application and without acquiescing to the propriety of this rejection, Applicants amended the claims to include the term “without performing fermentation” so as to be read as “A method for measuring factors causing early flocculation of yeast...without performing fermentation.” Applicants believe this claim amendment renders the rejection moot.

**V. Claim Rejection Under 35 U.S.C. §112, second paragraph**

The Office rejected claims 1-15 as allegedly failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Office outlines several alleged written description issues. Specifically, the office argues that: (1) Claim 1 is essentially meaningless where yeast is prepared, something is extracted from something, and precipitation is measured. A) “quickly” is a relative term and is not then related to any speed in the claims. B) “Brewing materials” reads on water among many other things, and most any carbohydrate source has been employed for fermentation. The preamble of claim 1 is directed to brewing materials but no such materials are found in the rest of the claim. C) In step 1 “or thereafter” is not understood in context. D) In step 2 the hyphens are improper. Also in step 2 “a test material sample” does not relate to the preamble and is unclear as to what it could be, glass possibly? E) In step 4 “a precipitation level “ is not understood because precipitation does not have levels. And how the steps claimed relate to the preamble is not seen. (2) There are many instances of lack of antecedent basis in the claims, in claim 6 “during extraction”, in claim 9 “the test system”, “the serial change”, for example. (3) In claim 8, “by using OD600” is not understood and is improper. (4) Abbreviations such as “min” and “sec” are improper in claims. (5) In claim 11 “non-early” is queried. In claim 11 “the sample “lacks antecedent basis. (6) In claim 12 “stand still” is queried, “instead” is not understood. In claim 14, “a high MW fraction of an extraction

solution” is not understood. And “barley ground materials” is not understood. (7) Claim 15 is improper, no factors are seen, and using is not a proper method step. And claim 15 fails to further limit claim 1 from which it might depend.

In an effort to advance prosecution of this application and without acquiescing to the propriety of this rejection, Applicants amended the claims to address the Office’s concerns. Additionally, claim 15 is canceled. As such, Applicants believe the rejections based on 35 U.S.C. §112, second paragraph are moot.

Regarding the term “by using OD600”, Applicants believe that one of skill in the art would recognize that as measuring optical density at a wavelength of 600 nm.

Concerning the term “stand still”, Applicants simply mean without agitation or shaking the sample.

Applicants note that the term “a high molecular weight fraction of an extraction solution” is defined in the specification. Specifically, the specification states “a water-extracted high-molecular weight fraction...can be readily prepared by a method for separating a high-molecular weight fraction such as ethanol precipitation, dialysis, ultrafiltration or gel filtration following the water extraction of brewing materials” (page 6-7 of the specification).

Finally, regarding the term “barley ground materials”, the specification states that “test material samples including barley or malt are ground according to need followed by water extraction or normal mashing” (page 14 of the specification). Additionally, Example 1 part 3, shows that “10 g or 50 g of malt was grounded roughly.” It would be clear to one of skill in the art that “barley ground materials” were the materials produced from this procedure.

Therefore, for at least these reasons, each of these terms would be understood by one of skill in the art. As such, Applicants respectfully request reconsideration and withdrawal of the rejection.

**VI. Invention Title**

The Office objects to the title of the invention. Specifically, the Office states that “[t]he title of the invention is not descriptive” (Office Action, page 6). Applicants have amended the title to clearly indicate the invention to which the claims are directed.



**CONCLUSIONS**

Applicants believe that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Date August 5, 2010

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